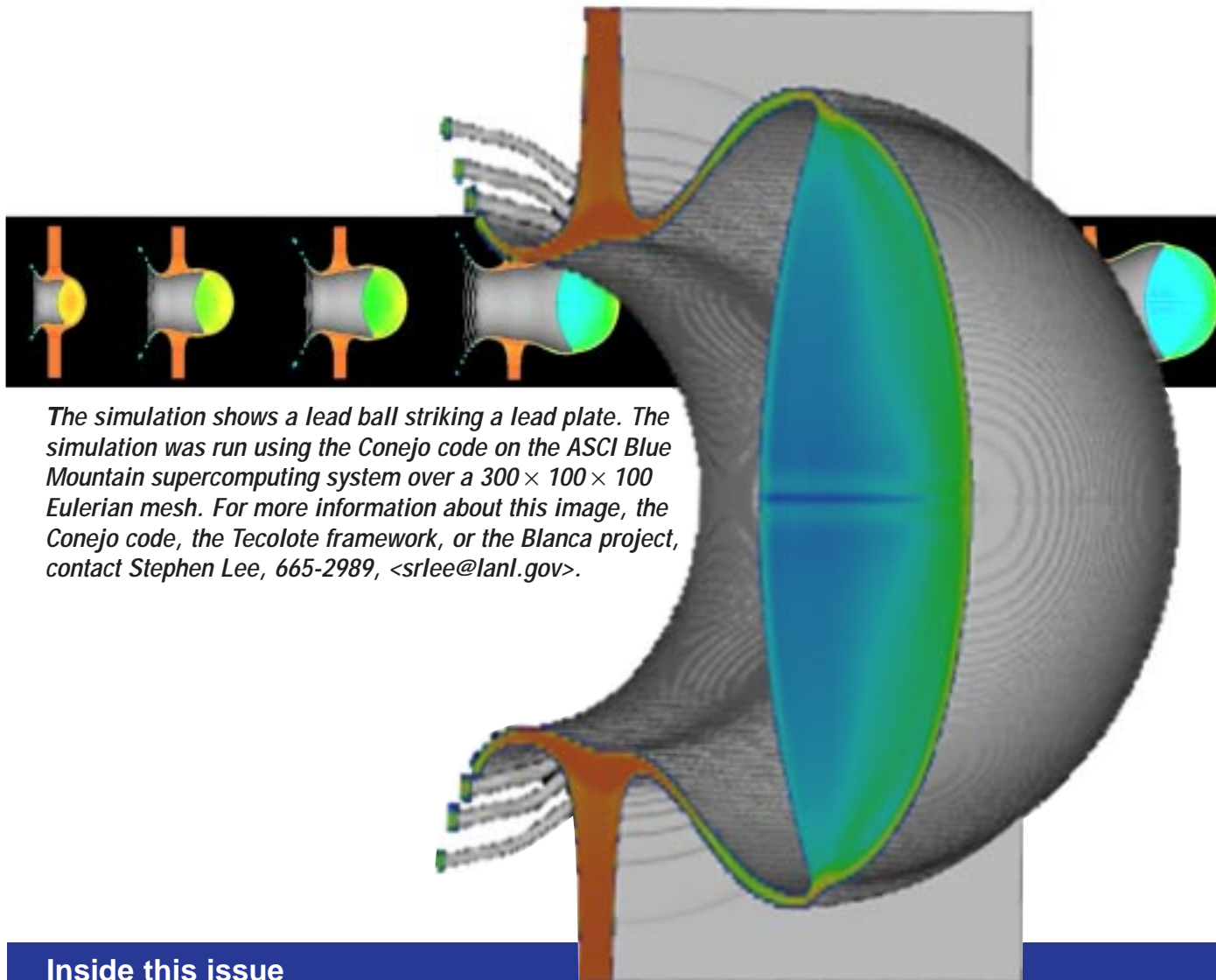


BITS

computing & communications news

February/March 1999

COMPUTING, INFORMATION, AND COMMUNICATIONS (CIC) DIVISION • LOS ALAMOS NATIONAL LABORATORY



The simulation shows a lead ball striking a lead plate. The simulation was run using the Conejo code on the ASCI Blue Mountain supercomputing system over a $300 \times 100 \times 100$ Eulerian mesh. For more information about this image, the Conejo code, the Tecolote framework, or the Blanca project, contact Stephen Lee, 665-2989, <srlee@lanl.gov>.

Inside this issue

Infrastructure

- Embedded Systems: The Year 2000 Bug Is Hiding 1

Desktop Computing

- Preserving Bandwidth on Your Windows NT Network 8
ESD: Working for and Serving You 10
Web Guru Challenges Web Page Designers 12

What's Happening

- BITS Gets New Design, New Editor 3

- New Windows NT Networking Services Available 4

- Research Library Adds Social SciSearch® Database 5

- BITS Welcomes New Deputy Division Director for Strategic Computing 6

- Lab Web Publishers Invited to IntraLab99 7

In the Classroom

- Research Library Training 14
Computer Training 15

- Index 17

Customer Service Center(505) 665-4444 or cichelp@lanl.gov

Because of the wide variety of CIC computing services, numerous facilities are available to address your questions. If you are uncertain whom to call, you can always call the Customer Service Center (CSC). CSC consultants are trained to either answer your question or locate someone who can. To reach the appropriate consultant, dial 665-4444 and make your selection from the following choices:

Option 1: New user topics including e-mail, passwords, registration, and World Wide Web.

Option 2: Labwide Systems such as Travel, Time and Effort, and Purchase Cards.

Option 3: Scientific computing, storage systems, and networking.

Option 4: Classroom instruction and training.

Option 5: Desktop Consulting for PC and Macintosh software and network configurations.

Consulting Via E-Mail

Customer Service Center.....	cichelp@lanl.gov
Scientific and engineering computing.....	consult@lanl.gov
Administrative and business computing.....	labwide@lanl.gov
Passwords and registration.....	validate@lanl.gov
Macintosh computing.....	Mac-help@lanl.gov
PC computing.....	PC-help@lanl.gov
UNIX computing.....	UNIX-help@lanl.gov

Other Useful Numbers

Advanced Computing Laboratory.....	665-4530
Central Computing Facility.....	667-4584
Network Operations Center.....	noc@lanl.gov or 667-7423
Telephone Services Center.....	667-3400

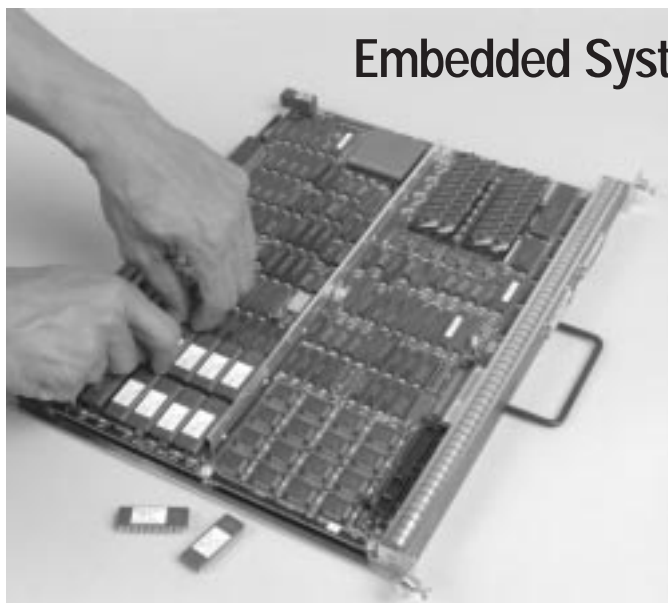


Figure 1. Bob Hoffman and the Network Support Team (Group CIC-5) are replacing chips in the Cisco EPROM (erasable, programmable read-only memory) router boards for the Labwide computer network.

Most of us can go for years, maybe decades, not thinking about how our offices are lighted, cooled, and heated, why the correct time shows up on our computer screens, and how telephones handle calls, just as long as these things work! We have become so used to well-engineered systems that need little or no attention that the potential for failures resulting from the Year 2000 date rollover to “00” comes as a shock. Throughout the Laboratory, in places where there may not even be a computer in sight, there are components or software in “embedded” systems that need attention to ensure operations as usual during and after the rollover to the Year 2000.

Readiness Efforts Underway

Virtually all processes and systems in industry and facilities designed and built after 1975 are computerized. In a way, the Laboratory’s many older systems are a blessing in disguise. “In many cases,” says Dave Padilla (Group FE-8) in charge of utilities at the Lab, “the Laboratory was spared the need to upgrade because the equipment was so old it was strictly mechanical.” But not everything is that easy... Padilla and Jerry Forte of Johnson Controls Northern New Mexico are supervising the installation of a new utility control system in the TA-3 power plant. A replacement, Year-2000-compliant HVAC (heating, ventilation, and air conditioning) system for the LDCC (Laboratory Data Communications Center) has been ordered (those supercomputers like it cool!). Bob Hoffman and the Network Support Team (Group CIC-5) are replacing chips in the Cisco EPROM (erasable, programmable read-only memory) router boards for the Labwide computer network (Figure 1). “This network is all things to

Embedded Systems: The Year 2000 Bug Is Hiding

all people,” Team member Ed Vigil says; “it routes everything.” CIC-4 is upgrading the Lab’s telephone system to ensure that it will work in the Year 2000. In addition, CIC-5 updated the way the Laboratory receives its time signal via satellite through the Global Positioning System (GPS). GPS dates began in 1972 and will roll over (incorrectly) after 1,024 weeks (on August 22, 1999). This required a new GPS receiving antenna atop the LDCC and new computer chips in the GPS boards to keep the Laboratory time stamp in sync with international time standards.

Assessment of Equipment that Runs Laboratory Facilities is Underway

Last summer, the Facility Management Council requested a systematic approach for identifying potential problems for Laboratory facilities that might result from the Year 2000 date rollover. The Laboratory contracted with Merrick, an architectural and engineering firm, to do a Year 2000 survey of facility systems. Merrick is investigating the Year 2000 readiness of many Laboratory facilities, concentrating on the most critical. They are inventorying and assessing the status of equipment that is listed on, or should be on, the Laboratory’s master equipment list. The first phase of the survey began in September 1998, and the follow-on full survey is due to begin in February 1999. The report from the first phase shows that of identified systems, about 9% are subject to noncompliance issues. The Facilities Planning Team, headed by Wally McCorkle (Group FE-IFMPO) and George VanTiem (Group S-8) is overseeing this effort. However, the

Do you have these embedded systems in your workplace?

- Barcode software
- Color recognition sensors
- Current sensors
- Dissolved oxygen measurement
- Dosimetry readers
- Gas measurement transmitters
- GPS
- HVAC
- Infrared products
- Mass airflow sensors
- Moisture sensors
- Oscilloscopes
- Printing presses
- Process controllers
- Pumps, including gas station pumps and those in buildings
- Refrigeration controls
- Safes and vaults
- Scanners
- Security alarms
- Ultrasonic sensors
- UPS (uninterruptible power supplies)
- Valves, including plumbing

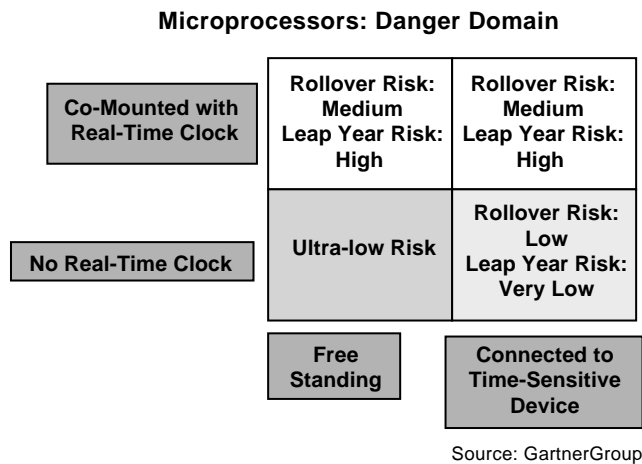


Figure 2. Ranking embedded system risk by features.

facility survey does not cover testing and monitoring equipment that is the responsibility of Laboratory programs.

Get a Grip

(Your toaster is fine, but other systems need your attention...)

Then what should you do about equipment that is your responsibility? First, determine what is equipment is at high risk for Year 2000 vulnerabilities. High-risk embedded devices share certain characteristics, as seen in Figure 2. They are programmable microprocessors connected to a real-time clock. Large-scale embedded systems use microprocessors to control multiple functions and include supervisory control and data acquisition systems, distributed control systems, building management systems, and laboratory equipment. These need your immediate attention, partly because there may be shortages or delays in obtaining parts or software upgrades. Then, have a look at the next-level, critical equipment for performing the job and maintaining the safety-security envelope. Do not bother with the low-risk category of stand-alone appliances (e.g., toaster, microwave, refrigerator, or vacuum

cleaner) because they run on the lowly microcontroller, with none of the features of programmable microprocessors. Once systems are identified as needing repair or upgrade and they are ranked in importance, you are ready to repair, test, and implement the changes.

Following this process might be difficult. Ron Strem and Mike Smith (1997)¹ have pointed out that the repair and test issues for embedded systems are complicated by the "black box" effect, created by combining user codes, user-added libraries, and user-added devices with similar vendor and subvendor components. Systems are generally interconnected, but dependencies may not be known or easily found. Also, embedded systems may be set up to perform a function on an interval cycle rather than on set dates. Because the Year 2000 is also a leap year (366 days), adjustments may be required. Neither will all these effects show up only on Saturday, January 1, 2000. But it has been widely recommended that the way to avoid the most common potential failure as December 31, 1999, rolls over to January 1, 2000, is to turn off systems with date issues and then turn them back on in the new century.

The 5 Steps to Year 2000 Readiness Apply to Embedded Systems

The five steps for Year 2000 readiness are inventory, assessment, repair, test, and implementation. Progress toward readiness at the Laboratory varies widely. Some systems have been through all the steps and are ready, but for many systems, we are still in the first, or assessment, stage. How big a bite the "Millennium bug" will have at the Laboratory depends on you. Look around your workplace; what looks like it may be computer controlled? Find out who manufactures that equipment and research the issues. The best place to begin is with the manufacturer's Year 2000 Web site. Start now, because just like embedded systems, there is more to this effort than meets the eye.

Steps to Identifying Problems in Embedded Systems

1. Is it older than 1975?
Probably don't need to look further unless newer design equipment has been installed through maintenance.
2. Does it contain digital equipment?
If yes, then continue.
3. Does it interface with or is it calibrated with digital equipment?
If yes, then continue.
4. Does it or the interface equipment contain a processor and/or memory?
If yes, then continue.
5. Does it or the interface display a date?
If yes, then the item is vulnerable to the date problem.
6. Does it or the interface have a menu function to set date?
If yes, then the item is vulnerable to the date problem.
7. Does it or the interface have a clock battery for maintaining a reference time?
If yes, then the item is vulnerable to the date problem.

Identified items should be inventoried as a system or specifically included in the scope of an already inventoried system.

Contributed by Diane Weir (CIC-DO) and Sue King (CIC-I) in CIC Division's Year 2000 Project Office.

¹Ron Strem and Mike Smith, A Suggested Process to Assist in Identifying Embedded Devices and Systems with Year 2000 Compliance Problems, TransAlta Utilities (1997), Available from the Embedded Software Association (ESOFTA) Web site, <<http://www.esofta.com/index.html>>

BITS Gets New Design, New Editor

An Editorial

As BITS readers, you will soon see a redesigned publication in response to the feedback from our readership survey. The articles and your way of accessing them will be tied more to readers' interests, whether administrative uses of computer networks or scientific supercomputing. We've been experimenting with some of that redesign in the last few issues in the way the table of contents is laid out and how the e-mail announcements of the Web version of BITS are structured. More exciting changes will follow; check out those new covers!

BITS welcomes Denise Sessions as new BITS editor. She has had a hand in the publication of this issue and will take over as of the next one. It's my pleasure to introduce her. Sessions brings nine years of experience in technical communication and has been trained by CIC-1 in technical editing. She has an MA in training and learning technologies from UNM. As a past member of the technical publications team, she edited and coordinated LA-12206, Atlas of Breeding Birds of Los Alamos County. She enjoys all outdoor activities including hiking, skiing, and bicycling.

Sessions looks forward to your submissions for BITS and will treat them with her light but sure editorial guidance. She also awaits your feedback about the publication.

I appreciate the opportunity to have served as Interim Editor for BITS, and I look forward to collaborating with the interesting people in CIC to contribute articles from time to time. Thanks to CIC-6 Group Leader Don Willerton and the BITS readership for their patience and support. Many thanks to my colleagues in CIC-1, without whose talents I couldn't have produced the newsletter: Chris Lindberg, Wendy Burditt, Andrea Gaskey, and Karina Nilsson. Special thanks to Tad Lane for always having an interesting and well written article to contribute.

And that brings me to the message I wish to leave with you. One person cannot write about everything that BITS readers are interested in. Have YOU written a paper or presented a poster? Are YOU doing some interesting research you'd like to share among colleagues? Have YOU and your team made an improvement in the way computing services are offered to the Laboratory? Contact Sessions at 665-4704, or e-mail denise@lanl.gov, and talk to her about contributing an article. That way you can be sure BITS publishes the topics YOU and your customers are interested in!



Ann Mauzy, CIC-1

New Windows NT Networking Services Available

CIC-5 is offering two new services for Windows NT networks across the Laboratory: domain name registration and WINS (Windows Internet Naming Service). There will be no charge for these services.

Registration of all the LANL domain names for the Laboratory will eliminate any duplicate names and thus enhance network communication, and it will lay the groundwork for future establishment of a Laboratory-wide NT Master Domain. It will also move LANL Windows NT users toward compliance with Technical Standard IA-8201, "Microsoft NT Naming Conventions." This standard for naming computer, server, and domain names (<http://www.lanl.gov/projects/ia/stds/ia820110.html>) was developed by a LANL Information Architecture committee.

WINS provides mapping of IP addresses to Microsoft machine names so that communication between machines is easier for users.

Avoiding Duplicate Names

With the growth of Windows NT computers around the Laboratory, system administrators are setting up Microsoft Windows NT networks for specific teams, groups, or divisions to use for data, application, and printer sharing. Many of these networks use a "domain" structure in which a specific name is assigned to the network.

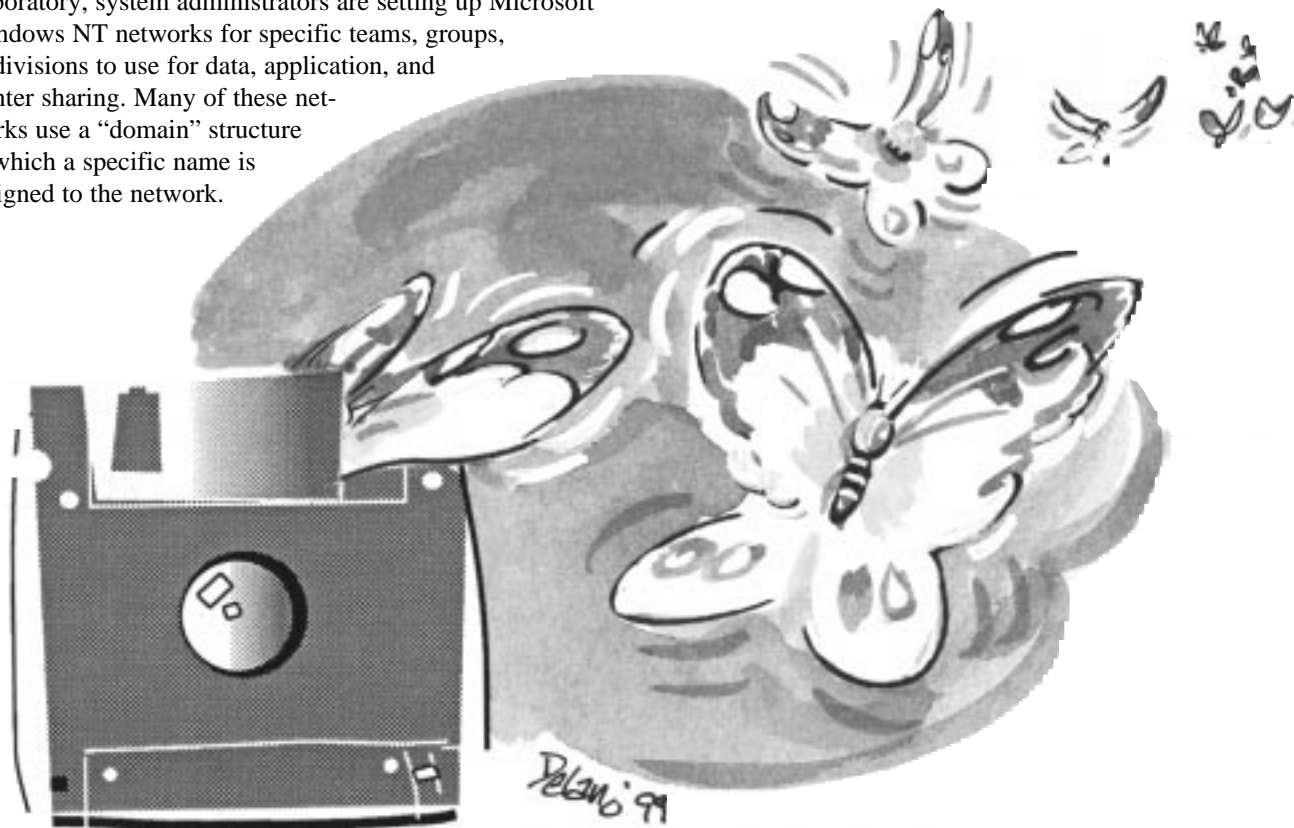
Working with colleagues across networks is common at the Laboratory, and the ability to communicate across networks requires that the domain names be unique. Until now, there has been no way for a system administrator to know the names of existing domains.

CIC-5 currently maintains the names in a database and can notify system administrators who register their domains if the name is already in use. About 25 domain names have been recorded thus far.

How to Register Your Domain

To register your domain, please send e-mail to Cheryl Host of CIC-5 at chost@lanl.gov and include the following information:

- 1) NT domain name,
- 2) Primary Domain Controller (PDC) server host name (must be registered with hostmaster), and
- 3) Description of what/who the domain serves.



At this time CIC-5 is manually entering the information into the database, but plans to incorporate the registration process into a Web-based hostmaster interface in the future.

Labwide WINS Service Established

Each Windows NT host has a machine name that conforms to Microsoft network naming conventions (NetBIOS naming) as well as an IP address, which is necessary for Internet connection. A WINS server provides dynamic translation or mapping of the IP address to the Microsoft machine name. This translation occurs every time users of Microsoft machines contact or share files with other Microsoft machines. WINS allows users to contact other Microsoft machines using a machine name instead of having to remember a numerical IP address. Using WINS servers also reduces network traffic.

CIC-5 has set-up a Labwide WINS server. The IP address for the primary WINS server is 128.165.5.5, and the secondary WINS server is 128.165.5.6. Settings for WINS server addresses on Windows 95/98/NT systems are located on the Network Control Panel under the TCP/IP protocol settings.

System administrators should ensure that each machine at the Laboratory is registered in the domain-naming system (DNS) through the hostmaster and that Microsoft networking machine names match the DNS registered names.

Note that many LANL users have been using CIC-2's Electronic Software Distribution (ESD) system, 128.165.129.1,

for WINS services. WINS services will not be supported on this server in the near future.

Future NT Network Services

Over the next several months CIC-5 will establish a Windows NT master accounts domain. The domain is LANL, and all NT users at the Laboratory can establish accounts in this domain. Having a LANL-wide domain will provide for centralized authentication for Microsoft system users.

The intent is to have one-time, one-place authentication for users of Microsoft services throughout the Laboratory. ESD and Lab-Wide Systems are planning to use the master accounts domain for authentication. CIC-5 also plans to include authentication security controls such as token-card and Kerberos authentication as technology comes available. Authorities and permissions will continue to be set by local system administrators throughout the Lab using software now being developed at CIC-5. The master accounts domain will reduce the amount of effort now required by administrators to allow sharing across networks.

Please contact Cheryl Host (chost@lanl.gov) of CIC-5 if you have questions, comments, or concerns about these new Windows NT services. To be kept apprised of and participate in development of Windows NT services, join the nt-ds@lanl.gov open mailing list by sending e-mail to listmanager@lanl.gov with "subscribe nt-ds" in the message body.

Contributed by Sheila Molony, CIC-1

Research Library Adds Social SciSearch® Database

Need access to economics, industrial relations, law, political science, or other social science literature? All this is now available electronically from the Research Library through the database titled "Social SciSearch® at LANL." Based on records from the printed Social Science Citation Index, it is produced by the Institute for Scientific Information and is a sister database of SciSearch® at LANL.

Updated weekly, Social SciSearch® at LANL covers 1,700 worldwide journals in a broad range of disciplines and includes all significant items such as articles, letters, editorials, etc. It also covers individually selected, relevant items with a social science focus from over 3,300 of the world's leading scientific and technical journals. In addition to searching by traditional methods such as author, title, and abstract words, cited reference searching is also available. A known paper is searched to identify more recent papers that cite the earlier work. In this manner other papers can be

identified that might be of interest. Hyperlinks are provided where the article or journal is available as full-text on the World Wide Web, and holdings in the LANL Research Library are noted in the full record. The same Weekly Alerting Service available for SciSearch® at LANL is also available in Social SciSearch® at LANL. Users may register for this service and then create a search strategy that will be matched automatically against each new weekly update.

This database is accessible via <http://scisearch2.lanl.gov:8082/lanl/> or by selecting Electronic Databases from the Research Library home page (<http://lib-www.lanl.gov/>) and then selecting Social SciSearch. If you have any questions about using this product, please call the reference desk at 7-5809. Check the training schedule (<http://lib-www.lanl.gov/libinfo/training.htm>) for upcoming free classes on the database.

BITS Welcomes New Deputy Division Director for Strategic Computing

John Morrison is CIC Division's new Deputy Division Director for Strategic Computing. An employee of the division since 1971, Morrison recently returned from a change-of-station assignment at DOE Headquarters (DOE HQ), in the Defense Programs Office. His assignment there was an extension of two years of work on the ASCI (Accelerated Supercomputing Initiative) program at Los Alamos.

Morrison has worked in high-performance computing for most of his career. Before his stint in Washington, he was the project leader for several pieces of ASCI, concentrating on the problem-solving aspects. He led the multilaboratory team that put together the specifications for the procurement that resulted in the ASCI Blue Mountain system at Los Alamos and the Blue Pacific system at Livermore.

His job now is to pull together the scientific computing elements in the division necessary to meet the goals of the ASCI program. "We have an enormous challenge to apply the present 3-teraflop capabilities and then 30-teraflop capabilities in 2002," Morrison says, "We need to do it in a way that makes this tremendous computing power effective for applications developers and users, primarily in X Division. My vision," he continues, "is that we will be successful in making these powerful systems useful and effective, and we will have the staff and infrastructure to support them."

Morrison's purview is ASCI implementation within CIC, overseeing the program aspects and groups that have ASCI deliverables. He pointed out that we also still serve the Defense Threat Reduction Agency (a Department of Defense Agency) in the open computing environment. "As we serve this and our other outside customers," Morrison said, "we are exploring approaches at the institutional level for a more powerful open computing capability."

Having worked at DOE HQ in a program office, Morrison brings to the Laboratory an understanding of the perspective of the Lab's major customer. "I've grown to appreciate Headquarters' requirements," he explains. "They have a different philosophy; meeting deadlines is their primary concern. In contrast," he continues, "the focus at the Lab is on producing the best quality. Our approach is to take an extra day to give the customer a better answer to the question." He feels that this understanding helps to work with the customer more effectively. "It's also nice to have personal contacts," he adds. "These working relationships give us an opportunity to help the customer understand our capabilities and to provide input for better-informed decisions."



BITS asked Morrison to predict what the future of supercomputing might be after the ASCI effort has evened out. "The new inroads into modeling and simulation that ASCI is building can be used by other programs," he replied. "The tools, infrastructure, and expertise can be applied to other areas, but we must align our efforts with our primary mission. For instance, the Delphi project is exploring application areas of national importance such as global climate modeling and forecasting natural disasters such wildfires, earthquakes, emerging and reemerging diseases, and extreme weather events. Global climate change is a topic under discussion nationally as the next big user of teraflop computing capabilities."

Morrison added that another effort to exploit advances in computation will be made by the growing field of computational biology, and we may take part in that effort to the extent that it matches our mission. He adds that we do need to overcome the impression in some segments of Washington that somehow we're "a weapons lab only," and that other institutions might be more capable than we are of doing non-weapons work.

Morrison lives in Santa Fe with his wife Christie (DDCIC) and their three dogs. He says he "has sport for every season," including skiing, fly fishing golfing, and recently, wood-working.

Lab Web Publishers Invited to "IntraLab99"

The Director's Office, Public Affairs, and CIC Division are sponsoring a free one-day workshop, "Web Publishing at LANL" for Web page developers, on Friday, March 26, at the Study Center. The workshop is an opportunity for those in charge of LANL Web content to share resources and knowledge, to overcome the feeling of isolation sometimes brought on by working in a rapidly changing environment.

The following is a list of topics that will be covered in the workshop. The agenda is at present still evolving. Up-to-date information can be found at www.lanl.gov/intralab99. Watch for further announcements on the "What's New" section of the LANL internal home pages at www.lanl.gov/internal/. Plan now to attend. Seating is limited, and registrations will be taken on a first-come, first-served basis.



Keynote Speaker Bob Newell, CIC Deputy Division Director for Information Services
"The Spider or the Fly?"

Publishing to CIC servers (including the S-7 viewpoint)

Search: including introduction of self-registration into categories

User Interface and Corporate Identity: includes both templates and minimum requirements including footer, navigation, and identity.

Authoring: comparison of various authoring tools (and limitations to each)

Tools: servlets, javascripts, perl scripts, templates, calendars, etc., Will include a demo of various scripts in use, a list of useful URLs, books, and programmers who can adapt a script for a client for a price.

Web Content Architecture: the interrelationship of HTML, CSS, XML, DOM, scripting, multimedia, and other Web content (includes CSS—Cascading Style Sheets, XML—Extensible Markup Language, DOM—Document Object Model)

Media: Live demo of real media. How to get help creating and publishing with RealMedia at LANL.

Preserving Bandwidth on Your Windows NT Network

Like traffic in a busy city, your network can become congested. Major causes are faster hardware, network-intensive applications, and errant configurations. Symptoms are poor response times, dropped connections, and anomalous workstation behavior. This article presents some configuration suggestions for Windows NT that will help reduce network traffic. The concepts can be applied to Windows 9x and 3.1x as well.

To start, if you have not yet done so, remove all network protocol stacks on the workstation except TCP/IP, if feasible. Unless there are NetWare servers, third-party networking components, or nonroutable workstations, TCP/IP is the obvious choice. The goal of configuring workstations with a single protocol is to decrease broadcast traffic. Besides using bandwidth, broadcast packets must be processed by every listening node on the network. For clear reasons, broadcast is highly undesirable.

Some workstation configurations might load several protocol stacks like TCP/IP, IPX/SPX, and NetBEUI simultaneously. With this multiprotocol setup, broadcast traffic is essentially tripled. Every few minutes, each protocol uses broadcast to announce the node's presence on the network. Additional broadcast traffic is generated when nodes attempt to make connections among themselves. One could refer to this traffic as "NetBIOS noise."

While removing unnecessary protocols from your Windows workstations is a step in the right direction, there is more you can do. To minimize broadcast traffic, configure workstations to use Microsoft Windows Internet Naming Service (WINS). WINS exists because Microsoft TCP/IP is not "pure IP" because it supports special naming and networking conventions. So a Windows workstation running TCP/IP has two machine names, the TCP name and the NetBIOS name, which may or may not be the same. A sound word of advice is to make the TCP and NetBIOS name match. Since Microsoft boasts pure IP with the arrival of NT 5, matching machine names could simplify the upgrade process.

Another benefit of having identical TCP and NetBIOS machine names is that you may use DNS (domain name service) for NetBIOS name resolution by checking the "Enable DNS for Windows Resolution" box under the WINS Addresses tab in TCP/IP Properties. This setting enables name resolution without the use of a WINS server, an "lmhosts" file, or broadcast. Of course, the workstation must be configured to use the DNS, and the target workstations must have static entries on the DNS.

When Windows workstations communicate with each other, they use NetBIOS. A WINS server provides NetBIOS name resolution, much like a DNS provides TCP name resolution. A nice feature of WINS is that "lookup" entries are made dynamically. Thus, when you configure a workstation to use a primary WINS server, the workstation registers at boot time. Further, when you configure a workstation with a primary WINS address, the workstation node type is changed to hybrid (0x8), which means that the workstation looks to the ARP (address resolution protocol) cache and WINS server before using broadcast for name resolution.

If workstations are configured to use WINS, they won't use broadcast to locate each other unless a lookup request fails. Moreover, Windows workstations configured to use a primary WINS server no longer use IP broadcast to announce their NetBIOS presence on the network. This is one advantage of using WINS over DNS or an lmhosts file. Now too, browsing on the network is enhanced since workgroup browsers can look to the WINS server, rather than relying exclusively on broadcast to build the browse list.

Rolling out WINS on a TCP/IP network is quick and easy. Simply install the WINS service on an NT server and start the service. The installation adds the WINS Manager icon to the Administrative Tools group. The default configuration will work for most applications.

The WINS service runs independently of NT security, so access security is of little concern. In other words, if you point a workstation at a WINS server, you needn't worry about user accounts, domains, trusts, and such. The only security issue is assigning an administrator-level account to the WINS service. Include the WINS database in your backups, too.

The workstation setup is simple, but you'll need to touch every workstation. Under TCP/IP Properties, enter the IP address of the WINS server in the Primary WINS Server box. Note that you have the option to enter a Secondary WINS Server. Use a secondary if you require redundancy, which is explained below. Once WINS is up and running, the WINS lookup database dynamically grows and eventually will contain a record of every configured node.

If the WINS server goes down and the lmhosts file and DNS are not used, workstations on the same subnet will still find each other with broadcast, but names cannot be resolved on another network. To provide WINS redundancy, use a WINS replication partner. A possible replication scheme at LANL

might be to push your local database to the primary LANL WINS server, which would be configured as a pull partner. Then configure your workstations to use the main LANL WINS server as their secondary WINS server.

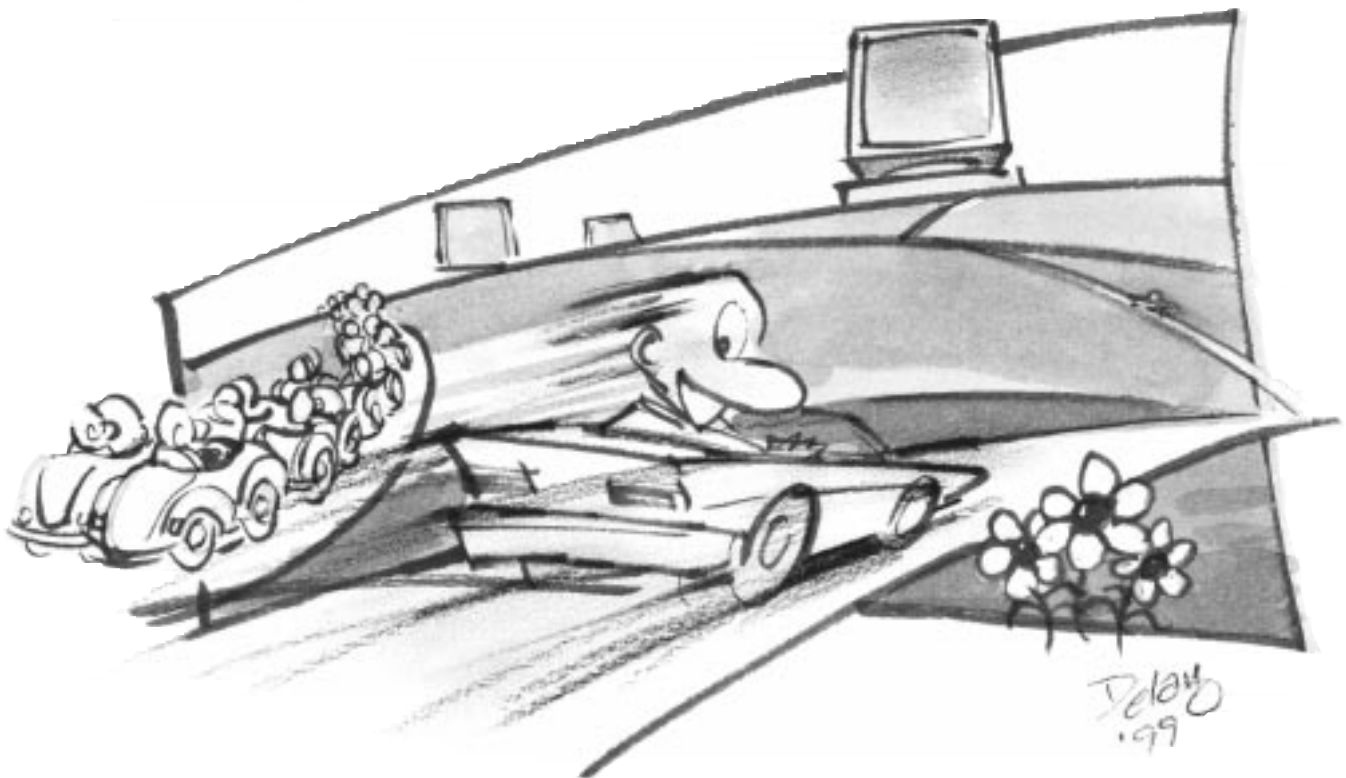
For even more redundancy install a second WINS server as a replication partner, or maintain an lmhosts file, even though the lmhosts file is a chore to maintain. If you implement a secondary WINS server, configure the primary and secondary to be both push and pull partners with each other. This ensures that the lookup databases are the same on both servers.

The following are some suggestions that apply to a WINS environment: do not have static WINS entries for WINS servers; enable LMHOSTS lookup on the WINS servers, and create an lmhosts file that contains references to all WINS servers and PDCs (primary domain controllers); use a "tree" structure when replicating between WINS servers; replicate only with WINS partners; and enable no more than two WINS proxy agents per subnet to support non-WINS enabled clients.

From the "pure IP" viewpoint, implementing WINS at the enterprise level is more work, generates extra network traffic, and is unnecessary. Maybe that is why Microsoft is phasing out NetBIOS. But right now, it is here, chewing up bandwidth. Even if you are a UNIX user who runs pure IP and you're not concerned about things like NetBIOS name resolution, you should know how Windows workstations might affect your network. Also, be aware that default Windows OS installations may not be optimal for network performance.

To conclude, minimize broadcast on Windows workstations by removing unnecessary network protocol stacks. Next, configure workstations to use WINS, DNS, or an lmhosts file for NetBIOS name resolution. Ultimately, configure single-protocol TCP/IP workstations to use primary and secondary WINS servers. For WINS redundancy, use a replication partner.

*Contributed by Andy Ryan,
Microsoft Certified Systems Engineer, EES-13*



ESD: Working for and Serving You



What is ESD?

ESD is the Electronic Software Distribution Web site that enables Laboratory personnel to purchase, download, upgrade, or transfer software/software licenses through a desktop computer configured with a Web browser.

A convenient and cost-saving tool, ESD provides software at discounted prices through site-licensing and bulk acquisitions. ESD saved Laboratory organizations \$4 million on software products in FY97 and \$3.4 million in FY98.

Responding to Customer Comments

ESD has been serving the Laboratory population for over three years. Each year, ESD's clientele, software offerings, and improvements grow. Responding to everyday suggestions from customers and our 1998 survey results, ESD has made several enhancements, described below:

- A new look and faster access
- On-line book ordering
- Free recycled software
- New Microsoft Select Program
- Improved Net installs

A New Look and Faster Access

Responding to customer feedback, ESD has added enhanced readability and new features and has reduced the number of Web pages through which to navigate.

Enhanced Readability and Improved Performance

- New buttons and menu bars
- Light-colored background
- Improved readability for monitors capable of only 256 colors
- Restructured and reprogrammed tasks
- Hardware upgrades to the ESD Web site server
- Faster response times
- One-stop product listing and ordering
- Navigation to order software without going through multiple pages
- Software lists that now allow you to order any of the listed products immediately

New Features

- Find and Order button: find, order, and save your selections while you order additional software.
- Your Licenses button: list, transfer, or return your software licenses and get software.
- Reset Server Access Permissions button: reset all your Net Install ESD Server Access permissions. Allows ESD proxies to acquire access permissions for products newly licensed to members of their proxy groups (located on the License Utility page).

On-line Book Ordering

In collaboration with ESD, the Otowi Station Bookstore is offering on-line book orders. Because ESD only sells software and not manuals, ESD initiated this partnership with Otowi Station to address customer requests for software documentation.

Features

- Order computer books for ESD software
- Books will be delivered to your mail stop within a week¹
- All Laboratory purchases are discounted 10%
- Pay with a charge code on-line or a credit card over the phone

How the On-line Book Ordering Works

After you order software on ESD, click the Otowi Station link on the Getting Software page under Physical Media and Documentation. Note: not all software products will have documentation available. The book icon within ESD indicates that documentation is available from the Otowi Station. The book icon can be seen in three places: the Getting page, the product Description page, and the Ordering list. Or, bookmark the Otowi Station Web page in your Web browser <(http://208.239.227.121/otowi/>.

¹Unusual or publisher out-of-stock items may cause delays. Otowi Station will notify you should this occur.

Free Recycled Software

The ESD Web site now offers its customers the opportunity to obtain free, recycled software. When you purchase software through ESD, you may possibly get the software at no cost.

Here's How

1. Find the desired software product(s) as usual.
2. Enter your charge code information.
3. Place the purchase order.
4. Read the Thank You Web page for a no-cost notice.

Here's Why

Customers have the option to return unneeded software licenses to ESD. If the customer returns the license within 14 days of purchase through ESD, he or she will get a refund. A license returned after the 14-day time period is paid for and cannot be resold. However, ESD is able to recycle these returned licenses to customers as free software. ESD also redistributes licenses owned by former employees. The catch is that ESD does not inform customers which software will be free. You simply have to try your luck and be pleasantly surprised.

New Microsoft Select Program

ESD has signed a new, two-year contract, January 1999–December 2000, with Microsoft. After offering a successful Microsoft Select Program in 1997 and 1998, ESD renewed the Select Program.

What is Microsoft Select?

Microsoft Select is a software-licensing agreement that allows Laboratory employees to purchase current Microsoft products at discounted rates and with maintenance. Maintenance entitles the user to software upgrades and new releases until a specified date by the software company at no additional cost. For example, the Laboratory has maintenance contracts with ON Technology (Meeting Maker), Symantec, Netscape, and Qualcomm (Eudora). Regarding the Microsoft maintenance, Laboratory employees are entitled to free upgrades and new releases until December 31, 2000, when they purchase a maintenance license for a Microsoft product on ESD.

Features

- Software prices are discounted.
- Maintenance prices are not prorated over the two years like the Select '97–'98 Program prices were.

- Windows 95 and 98 are no longer free. However, if you are already registered for one of the operating systems on ESD, you can get the other operating system at no cost through ESD. Look for Windows 95/98 "Select Special" when you search for either operating system on ESD.
- A single-software, single-machine license: users will no longer be able to have one license for several office computers. Users will have to purchase a second license for a second office computer or home computer. Exception: no need to buy a second license for a laptop.

Improved Net Installs

What is a Net Install?

After correctly configuring your computer, you can install software quicker and easier through a Net install (network installation) than through a Web download. For a Net install to work, you must connect your computer to the ESD server. With the server connection, you can copy files or run software installers directly over the network without accessing the ESD Web site.

Also, a Net install is faster than a Web download software installation, and it eliminates the need for local hard disk space to hold interim files.

Easier Instructions and Installation files

- Better, concise instructions for Windows users
- Newly organized installer files to prevent needless searching for your desired software
- Easily accessible Read Me files
- Easily accessible LANL-specific information, such as registration numbers, that before was only available on the ESD Web site.

To Use ESD

1. Access ESD at <<http://esd.lanl.gov>>.
2. Log on with your Z# and smartcard or ESD password.
3. Have charge code information ready for software purchases.

Contact ESDmaster@lanl.gov for comments or questions.

Contributed by Nikki Watson

*The REDI (Remote Electronic Desktop Integration) Project
CIC-6 Training, Development and Coordination*

Web Guru Challenges Web Page Designers

Dr. Jakob Nielsen visited the Laboratory in October to teach two classes on “Discount Usability” and present a lecture entitled “You Are Doomed: Ways to Avoid Mistakes on Web Projects.” As a world-renowned expert on Web design and usability, he was unequivocal about the state of the Internet (“The Web is bad; really bad.”) but also offered concrete, practical suggestions on how to improve Web sites. Although he provided countless insights, there were five lessons that really struck home for the more than 400 people who heard him talk.

Recognize the Growth Potential of the Web

“When Alexander Graham Bell invented the telephone, he did not anticipate that we would use it to order pizza. Similarly,” said Nielsen, “in six years the Internet will be 10,000 times as important as it is today.” There are several hundred thousand Web sites today, but in 2003, there will be two million Web sites. He predicts that the Internet, already becoming dominant for computer users, will replace the telephone and newspapers as the way most people get things done.

The growing dominance of the Internet has implications for design. New things—shopping, banking, investing, information retrieval, entertainment—will live in that environment, and designs must accommodate what users have come to expect when using the Web.

Know Thy Users and Thy Purpose

One of the major mistakes of many Web sites today is that they completely ignore what users want. They want information, and they want it quickly. The strength of the Internet is that it is a wonderful medium for conveying information of all sorts. But too often the information on Web sites is either nonexistent or difficult to find.

Nielsen pointed to the example of an older version of the BMW Web site, which rhapsodized at length about the wonderful experience drivers would have with one of its sports cars but nowhere listed the specific features of the car or its price. “After my humiliating the company to the World,” Nielsen said, “they finally redid their pages so that now you can at least find the price.”

Similarly, some corporations make the mistake of organizing their pages by who reports to whom, which is rarely what users want to find out. They want information about products. “Does it make sense for a user interested in buying both a computer and a printer from Hewlett Packard to have to know the structure of the company in order to buy both?” It would be useful to organize a site by corporate structure (the

LANL internal home pages, for example) only for the users who are members of the corporation.

Users approach the Internet differently than they do other media. If a page takes too long to download, if users can’t find what they want immediately, they leave the page, perhaps never to return again. After all, users have control of the mouse!

Keep It Simple

Even though the Internet is still in its infancy and primitive in comparison to computer applications, there are still many interesting effects that can be implemented on the Web. Nielsen cautions against getting carried away. Take, for example, animation. In Nielsen’s opinion, “Animation on the Web is not used to communicate but to annoy.” Many users cover up moving parts so that they can concentrate on the information they are trying to find. “Thus,” warns Nielsen, “unless there is a clear purpose for the animation, don’t use it.”

Art work also has a certain allure, again because it is easy to design interesting, colorful graphics. Nielsen cited the frequent case of the art director designing a beautiful Web page on a powerful computer that supports thousands of colors. Unfortunately the vast majority of users do not have such computers, and most are connecting through very slow modems. Those beautiful images take forever to download. “Download time rules the Web for user experience,” warns Nielsen. His own Web site (<http://www.useit.com>) has no graphics but is rich in information.

Test Your Site for Usability and Redesign

Nothing improves the usability of a Web site as much as testing it on real users, according to Nielsen. Too often development teams spend most of their time discussing issues with their colleagues instead of with their customers. Their mindsets are different. Testing the design on real customers is necessary if the Web site is to be usable.

Nielsen countered people’s fears that usability tests were costly and time-consuming to administer. They do not need to be elaborate productions with videos, one-way mirrors, a host of test subjects, and elaborate analyses of the data. The goal of the test is to find out whether a site, its navigation, search engine, or some other feature is usable by the intended audience. In an iterative design process, the goal of the tests is to discover whether the latest changes made the prototype better or worse.

Redesign Your Web Site Yearly

"The Internet is not static, nor should a Web site be," said Nielsen. Too often companies budget only for the initial implementation of a Web site. Managers do not realize that, at a minimum, Web sites need to be maintained. Links go bad, information becomes stale or obsolete, users capabilities and needs change. Nielsen pointed out that, in the early days, many users either did not like to scroll or did not know how to scroll down the page, and he advised designers to keep their pages very short. That is no longer the case; indeed, users now seem to prefer scrolling down longer pages to having to click through many shorter pages.

Redesigning pages does mean a lot of work, Nielsen realizes. However, it gives organizations a chance to rethink their purpose, to take advantage of technological changes, and to learn from their mistakes. Using the current Web design as the prototype for the next design means that the team can use log files to find out which features users liked or disliked (or couldn't find); search engine logs tell what users wanted to find. Redesign gives the team another chance to improve the usability of the Web site.

Nielsen gave many more suggestions for improving Web sites during his three days at the Laboratory, but these five lessons form a solid starting point for anyone wanting to improve a Web site. With over 200,000 pages housed here at the Laboratory, we have plenty of opportunity for doing so!

Contributed by Patricia M. Hummer, CIC-I.



Research Library Training

The LANL Research Library offers a variety of training opportunities for the Laboratory community. Sessions focus on specialized library databases and other electronic resources. While the sessions listed below will be held at the library, training can be arranged at your site. Contact the Library by phone at 7-4175 or by e-mail to <library@lanl.gov> to register for a session or to arrange a special session/training at your site.

Date	Time	Subject Matter
3/3/99	1:00-1:30	Research Library Tour
3/3/99	1:30-2:00	Introduction to Electronic Library Resources
3/9/99	1:00-1:30	Alerting Service for the SciSearch® & Social SciSearch® Databases
3/17/99	1:00-1:30	Research Library Tour
3/17/99	1:30-2:00	Introduction to Electronic Library Resources
3/18/99	2:00-4:00	InfoSurfing: Basic Web Searching Strategies
3/31/99	1:00-1:30	Research Library Tour
3/31/99	1:30-2:00	Introduction to Electronic Library Resources
4/6/99	1:00-1:30	Grants & Funding on the WWW
4/14/99	1:00-1:30	Research Library Tour
4/14/99	1:30-2:00	Introduction to Electronic Library Resources
4/15/99	2:00-4:00	InfoSurfing: Basic Web Searching Strategies
4/28/99	1:00-1:30	Research Library Tour
4/28/99	1:30-2:00	Introduction to Electronic Library Resources

Computer Training

The Customer Service Group (CIC-6) offers technical computer training (enterprise information applications, communications, office administration, and Web authoring) and advanced technical computer training (programming languages, system administration, and advanced applications). To register for a course access our Web page at <http://www.lanl.gov/internal/training/training.html>.

Or from the LANL home page select the links: Training, Computer. For further information about technical computer training call (505) 667-9559, and for advanced technical computer training call (505) 667-9399.

Communications

Eudora 4.x
Meeting Maker 5.0.3

Office Skills 2000

Office Skills 2000—LANL Computing
Office Skills 2000—Professional Development

Web Authoring and Browsing

Dreamweaver—Mac or PC
FrontPage 98
HTML Basics
HTML Intermediate

Coming Soon

Directory Information System (DIS)—Web
Recharge
Procurement Desktop

Enterprise Information Applications (EIA)

Data Warehouse—Basics
Data Warehouse—EDS Reports
EDS—Basics
EDS—Training Plans
Foreign Travel—GUI
Infomaker
Invoice Approval System
Purchase Card System
Time & Effort GUI
Travel Foreign GUI
Travel Domestic GUI
Web JIT

Other EIA Courses

Financial Management Information System (FMIS)
Property Accounting, Inventory and Reporting
System (PAIRS)
Signature Authority System (SAS)
Secretarial/Contract Services (SE)
Salary Review System (SRS)
Directory Information System (DIS)
Automated Chemical Information System (ACIS)

Application Training

Advanced WWW Development
FrameMaker Basic & Advanced
Foundations of IDL Programming
IDL 5.0 Graphic Object Workshop
Netscape Servers for Intranet Development
Origin2000 Applications Programming and Optimization
Running on the ASCI Blue Mountain Systems
Sendmail-Managing Internet Mail
C++ and the Unified Modeling Language
Sybase Performance and Tuning for System 11
Sybase SQL Server Administration
Unix (Beginning)
Unix (Advanced)
Visual Basic 5.0 Fundamentals
Visual C++ Windows Programming

Programming Training

C Programming (Beginning)
C Programming (Advanced)
C++ for Experienced C Programmers
ANSI/ISO C++ Programming Clinic (Advanced C++)
Java Programming
Java Programming Workshop
Distributed Programming With Java
Object Technology—A Management Overview
Object-Oriented Analysis and Design
Perl Programming
C-Shell Programming
Programming or Beginners Using Java

System Administration Training

SGI System Administration (Beginning)
SGI System Administration (Advanced)
SGI Network Administration
SGI Performance Evaluation and System Tuning
Solaris 2.X System Administration
Solaris 2.X Network Administration
Solaris 2.X Server Administration
Unix and Windows NT Integration
Windows NT Workstation and Server
Windows NT Optimization and Troubleshooting
Windows NT Security

The CIC-6 Customer Services group plans to hire an ASCI Training Specialist. While we wait for this person to hire on and come up to speed, the Training Team is offering ASCI training on subjects that were determined to cause the most trouble for our customers. If you're interested in participating in one or more of the sessions below, please contact Leslie Linke (505-667-9399 -- lal@lanl.gov) or Susan Simonsic (505-667-9559 -- sues@lanl.gov). If these sessions fill up, additional sessions may be scheduled.

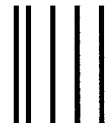
The schedule for these sessions is as follows:

An ASCI Overview	Mon., 2/22, 1999	9:00–11:00 a.m.
Running MPI on Blue Mountain	Tues., 2/23, 1999	9:00–11:00 a.m.
TotalView	Wed., 2/24, 1999	9:00–11:00 a.m.
LSF	Fri., 2/26, 1999	9:00–11:00 a.m.
HPSS	Mon., 3/15, 1999	9:00–11:00 a.m.

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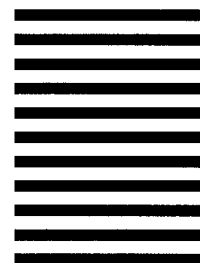
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This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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1998 12-MONTH INDEX

For a more complete index, see <<http://www.lanl.gov/Internal/divisions/cic/publications.html>>

Keywords	Title of BITS Article	Date	Page
ASCI	<i>Blue Mountain Is World's Fastest Computer</i>	Dec. '98	1
BITS Announcements	<i>BITS Gets New Design, New Editor</i>	F/M '99	3
BITS Interviews	<i>Rick Luce</i>	Apr. '98	1
		J/J. '98	5
	<i>Gary Clark</i>	J/J '98	2
	<i>John Blaylock</i>	A/S '98	2
	<i>Chris Kemper</i>	A/S '98	8
	<i>Bob Newell</i>	O/N '98	1
	<i>Earleen Eden</i>	O/N '98	3
	<i>Dale Land</i>	Dec. '98	11
	<i>John Morrison</i>	F/M '99	6
CIC (Computing, Information, & Communications)	<i>BITS Welcomes New Deputy Division Director for Strategic Computing</i>	F/M '99	6
CIC-2	<i>CIC-2's Future Is in Stewardship, Automation, and "Fun Stuff"</i>	Dec. '98	11
CIC-10	<i>CIC-10: "Knowledge Is Our Most Important Product"</i>	O/N '98	3
CIC-12	<i>CIC-12 Moves Into Software Quality Assurance, Needs Scientific Programmers</i>	J/J '98	2
CIC-14	<i>CIC-14 Becomes a Bridge to Human Knowledge</i>	Apr. '98	1
	<i>Library Without Walls Anticipates Its Next Generations</i>	J/J '98	15
Desktop Computing	<i>CIC-2's Future Is in Stewardship, Automation, and "Fun Stuff"</i>	Dec. '98	11
Desktop-Computing Costs	<i>Eye-Opening Reports About Desktop Computing Costs</i>	J/J. '98	10
E-mail	<i>MacTips: Dealing with [E-mail] Attachments in Eudora Pro</i>	Aug. '97	16
	<i>E-Mail Server Now Available in the Secure Network</i>	Feb. '98	8
Embedded Systems:	<i>The Year 2000 Bug Is Hiding</i>	F/M '99	1
ESD	<i>Working for and Serving You</i>	F/M '99	10
Filters	<i>Content Labeling and Signing: Getting Ready for Filters</i>	Apr. '98	10
Fraud Detection	<i>Detecting Tax and Medicare Fraud</i>	J/J '98	4
GeoRef	<i>GeoRef Now Available at Your Desktop</i>	Feb. '98	13
HPCwire	<i>Lab Considers Group Subscription for HPCwire</i>	Apr. '98	4
Information Systems	<i>Engineering Index Is Now Available from the Research Library</i>	Dec. '98	13
	<i>Research Library Adds Social SciSearch® Database</i>	F/M '99	5
JavaScript	<i>JavaScript Observations and Tips: Part II</i>	May '97	11
	<i>Enabling Cookies and JavaScript on Netscape</i>	Mar. '98	5
Labwide Systems	<i>Customer Feedback Guides Improvements to Labwide Systems</i>	Aug. '97	4
Newell, Bob	<i>24 Years Later, Bob Newell Joins the Lab as Deputy CIC Division Director</i>	O/N '98	1
Networks	<i>Laboratory Unclassified Network Will Implement Changes for Security</i>	Dec. '98	3
	<i>Preserving Bandwidth on Your Windows NT Network</i>	F/M '99	8
PNG	<i>It's Time for PNG: A Graphics Format You Can Pronounce</i>	O/N'98	7
Popular Science Award	<i>PS Awards LANL Web</i>	O/N '98	12
Radiation Transport	<i>Unstructured-Mesh Radiation Transport</i>	J/J '98	1
RAGE	<i>The Los Alamos RAGE Code: Scalable, Parallel Performance</i>	Apr. '98	5
Records Management	<i>CIC-10: "Knowledge Is Our Most Important Product"</i>	O/N '98	3
SciSearch	<i>Research Library Adds Social SciSearch® Database</i>	F/M '99	5
Supercomputing	<i>Blue Mountain Is World's Fastest Computer</i>	Dec. '98	1
UNICOS	<i>Transition of Machine Gamma to UNICOS 9.0.2.6</i>	Mar. '98	5
Wildfires	<i>Forecasting Wildfires and Other Crises</i>	Apr. '98	3

Keywords	Title of BITS Article	Date	Page
<i>Windows NT</i>	<i>Preserving Bandwidth on Your Windows NT Network</i>	<i>F/M '99</i>	<i>8</i>
<i>World Wide Web (WWW or Web)</i>	<i>Research Library's WWW Online Catalog Improved</i>	<i>Nov. '97</i>	<i>10</i>
	<i>Extending Web Documents: Getting Ready for XML</i>	<i>Mar. '98</i>	<i>8</i>
	<i>Tips for Desktop Users Available on the Web</i>	<i>Apr. '98</i>	<i>8</i>
	<i>Enterprise Information Applications Available on the Web</i>	<i>J/J '98</i>	<i>8</i>
	<i>Research Library Now Offering INSPEC Database</i>	<i>J/J '98</i>	<i>9</i>
	<i>It's Time for PNG: A Graphics Format You Can Pronounce</i>	<i>O/N '98</i>	<i>7</i>
	<i>Lab Web Publishers Invited to IntraLab99</i>	<i>F/M '99</i>	<i>7</i>
<i>Year 2000 (Y2K)</i>	<i>The Year 2000 Bug Is Hiding</i>	<i>F/M '99</i>	<i>1</i>

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Publication Notice

Because the BITS staff needs to update and publish the fourth edition of the Special BITS: "Introduction to Computing at Los Alamos", we will not publish the regular BITS magazine until June, 1999. We'll be sending an e-mail message to electronic subscribers when the June issue is on line. Those who receive hard copies of BITS will receive their June issue in the mail.

BITS can be accessed electronically via the following URL:

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